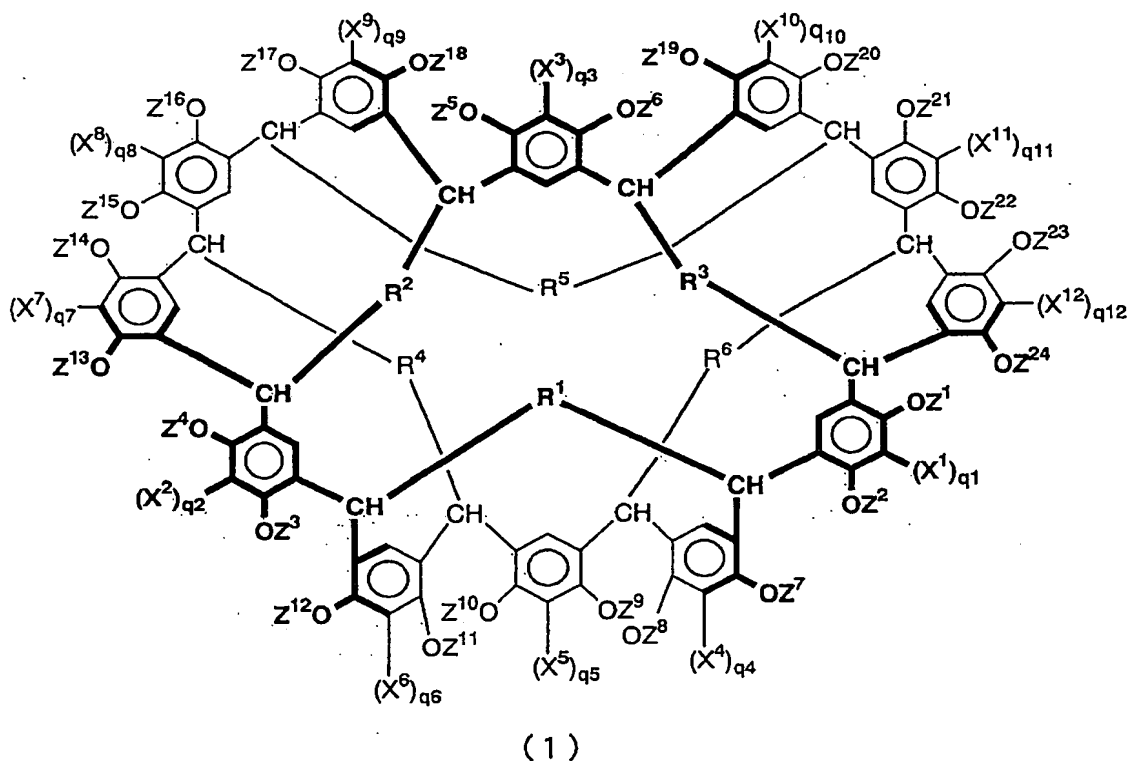


# CLAIMS

1. A calixarene compound shown by following formula (1):

[Formula 1]

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wherein  $R^1$  to  $R^6$  individually represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $X^1$  to  $X^{12}$  individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group

having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group;  $Z^1$  to  $Z^{24}$  individually represent a hydrogen atom, a group having a polymerizable functional group, a group having an alkali-soluble group, or a substituted alkyl group having an alkyl chain with a 1 to 8 carbon atom content, or two adjacent Zs in combination represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $q^1$  to  $q^{12}$  individually represent an integer of 0 or 1.

2. The calixarene compound according to claim 1, wherein  $X^1$  to  $X^{12}$  in the formula (1) are methyl groups.

3. The calixarene compound according to claim 1, wherein  $q^1$  to  $q^{12}$  in the formula (1) are 0.

4. The calixarene compound according to any one of claims 1 to 3, wherein  $R^1$  to  $R^6$  are individually an alkylene group having 3, 5, 7, or 8 carbon atoms.

5. The calixarene compound according to any one of claims 1 to 4, wherein all of the  $Z^1$  to  $Z^{24}$  groups in the formula (1) are hydrogen atoms.

6. The calixarene compound according to any one of claims 1 to 4, wherein at least one of the  $Z^1$  to  $Z^{24}$  groups in the formula

(1) is a group other than hydrogen atom.

7. The calixarene compound according to claim 6, wherein at least one of the  $Z^1$  to  $Z^{24}$  groups in the formula (1) has a polymerizable functional group.

8. The calixarene compound according to claim 7, wherein the polymerizable functional group is a polymerizable unsaturated group and/or a cyclic ether group.

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9. The calixarene compound according to any one of claims 6 to 8, wherein at least one of the  $Z^1$  to  $Z^{24}$  groups in the formula (1) has an alkali-soluble group.

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10. The calixarene derivative according to claim 9, wherein the alkali-soluble group is at least one group selected from the group consisting of a carboxyl group, amino group, sulfonamide group, sulfonic acid group, and phosphoric acid group.

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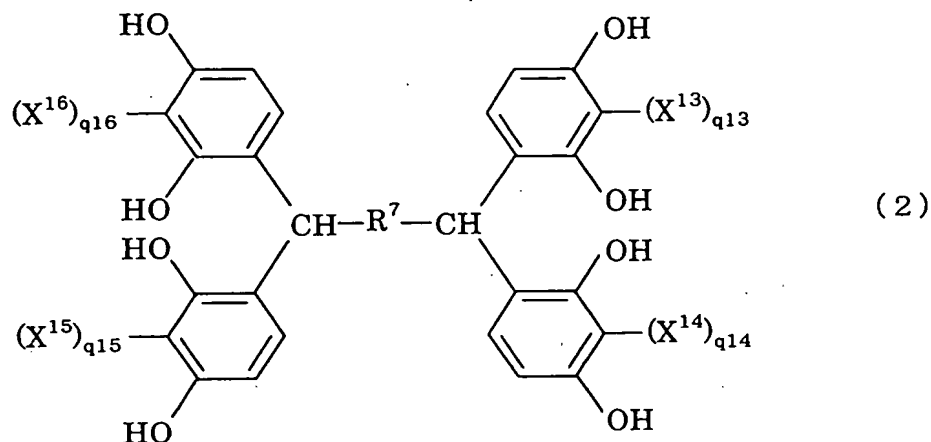
11. The calixarene derivative according to any one of claims 6 to 10, wherein at least one of the groups among  $Z^1$  to  $Z^{24}$  in the formula (1) has both a polymerizable functional group and an alkali-soluble group.

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12. At least one intermediate of a calixarene compound selected from the group shown by the following formulas (2),

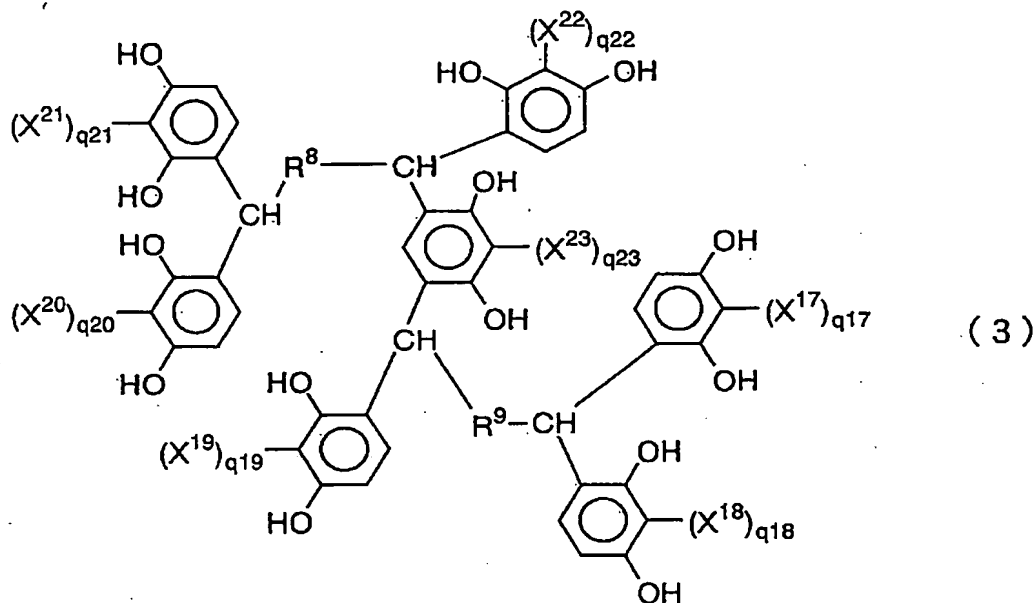
to (8):

[Formula 2]



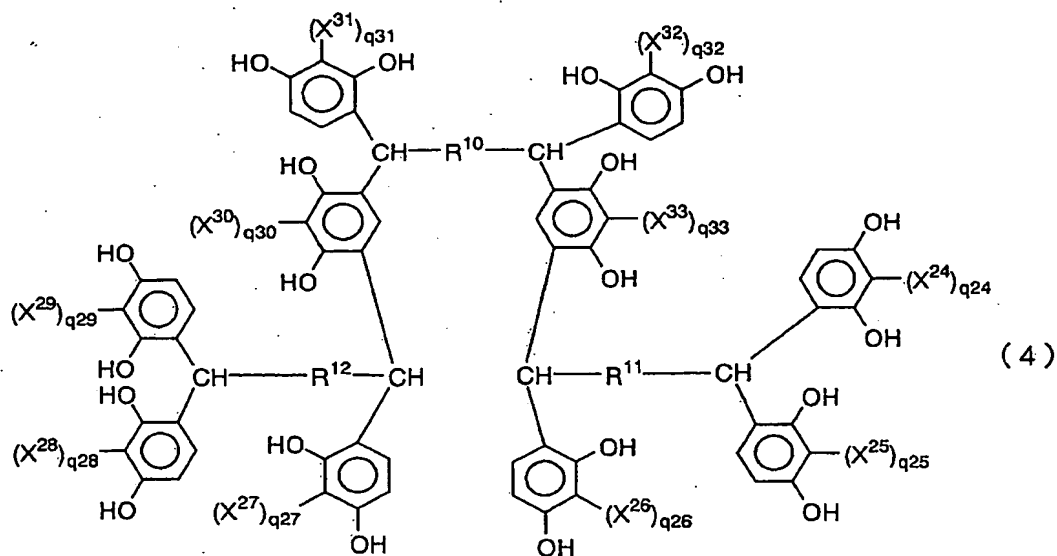
wherein  $R^7$  represents a substituted or unsubstituted alkylene  
 5 group having 1 to 8 carbon atoms;  $X^{13}$  to  $X^{16}$  individually  
 represent a substituted or unsubstituted alkyl group having 1  
 to 10 carbon atoms, a substituted or unsubstituted alkenyl  
 group having 2 to 10 carbon atoms, a substituted or  
 unsubstituted alkynyl group having 2 to 10 carbon atoms, a  
 10 substituted or unsubstituted aralkyl group having 7 to 10  
 carbon atoms, a substituted or unsubstituted alkoxy group  
 having 1 to 10 carbon atoms, or a substituted or unsubstituted  
 phenoxy group; and  $q^{13}$  to  $q^{16}$  individually represent an integer  
 of 0 or 1,

[Formula 3]



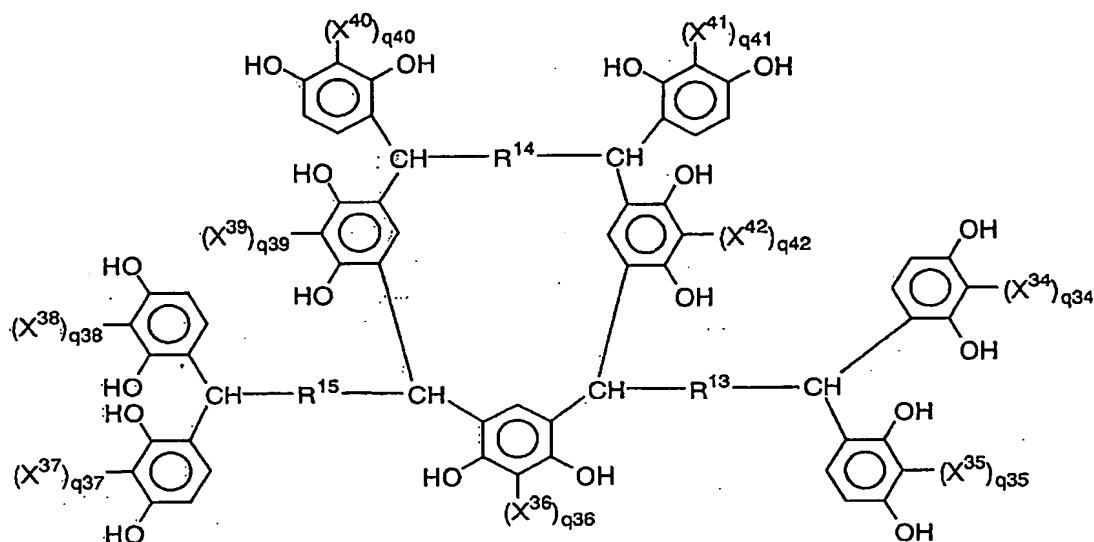
wherein  $R^8$  and  $R^9$  individually represent a substituted or  
 5 unsubstituted alkylene group having 1 to 8 carbon atoms;  $X^{17}$   
 to  $X^{23}$  individually represent a substituted or unsubstituted  
 alkyl group having 1 to 10 carbon atoms, a substituted or  
 unsubstituted alkenyl group having 2 to 10 carbon atoms, a  
 substituted or unsubstituted alkynyl group having 2 to 10  
 10 carbon atoms, a substituted or unsubstituted aralkyl group  
 having 7 to 10 carbon atoms, a substituted or unsubstituted  
 alkoxyl group having 1 to 10 carbon atoms, or a substituted or  
 unsubstituted phenoxy group; and  $q^{17}$  to  $q^{23}$  individually  
 represent an integer of 0 or 1,

[Formula 4]



- 5 wherein  $R^{10}$  to  $R^{12}$  individually represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $X^{24}$  to  $X^{33}$  individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group;  $q^{24}$  to  $q^{33}$  individually represent
- 10
- 15 an integer of 0 or 1,

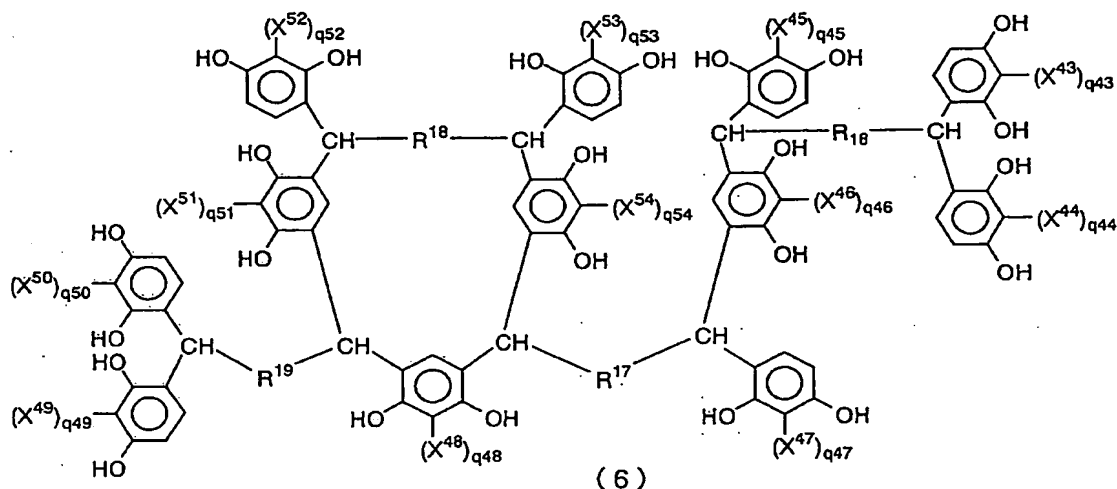
[Formula 5]



(5)

- 5 wherein  $R^{13}$  to  $R^{15}$  individually represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $X^{34}$  to  $X^{42}$  individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group; and  $q^{34}$  to  $q^{42}$  individually
- 10
- 15 represent an integer of 0 or 1,

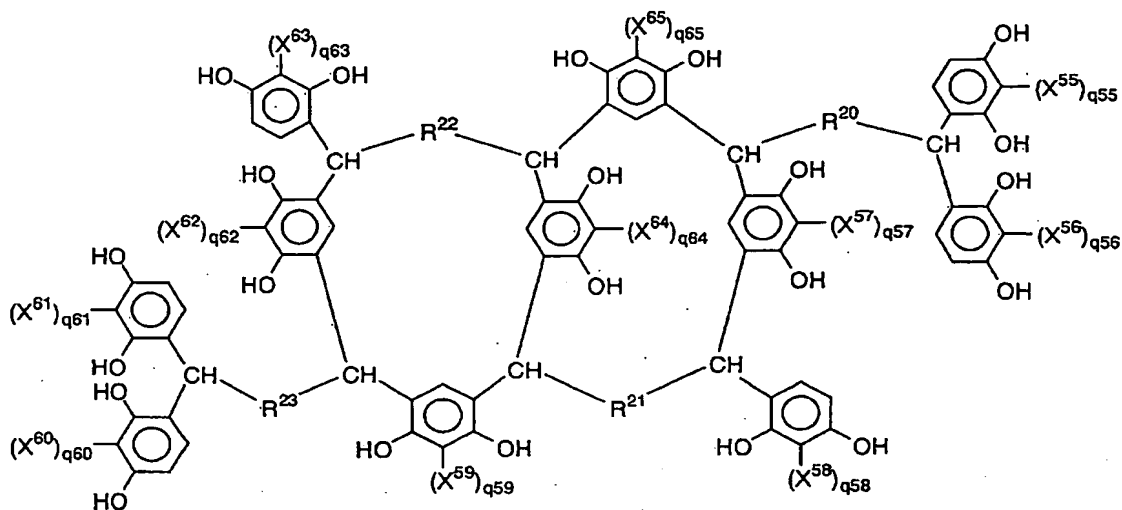
[Formula 6]



- 5 wherein  $R^{16}$  to  $R^{19}$  represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $X^{43}$  to  $X^{54}$  individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group; and  $q^{43}$  to  $q^{54}$  individually
- 10
- 15 represent an integer of 0 or 1,

[Formula 7]



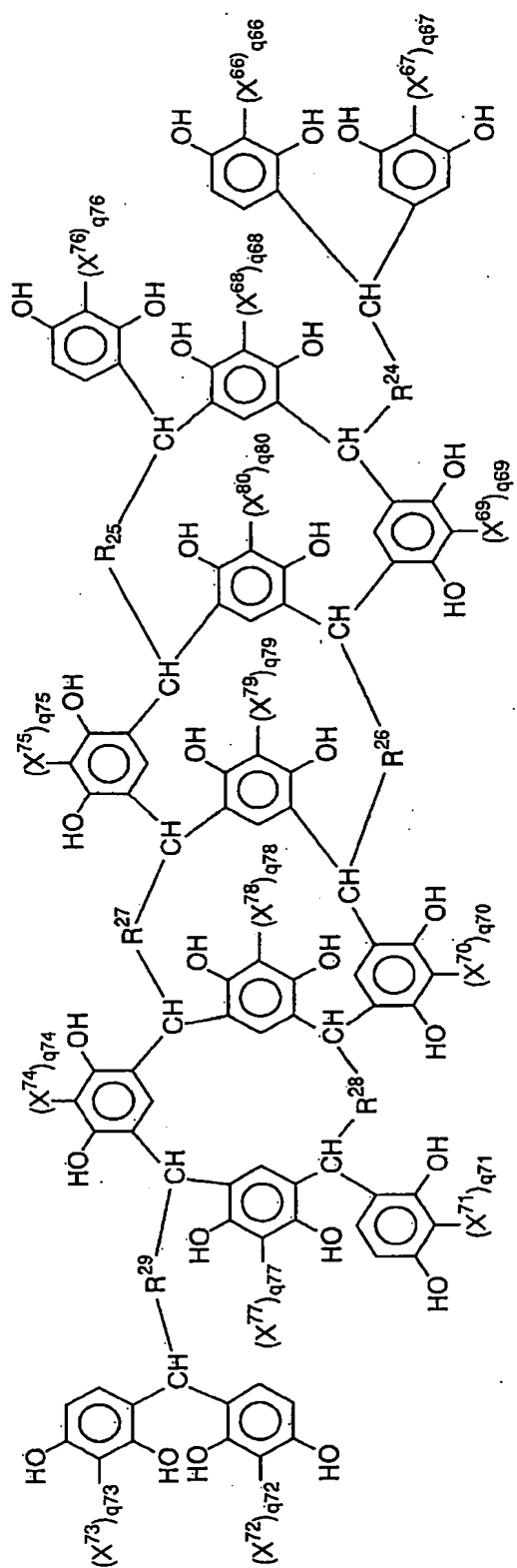


(7)

wherein  $R^{20}$  to  $R^{23}$  represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $X^{55}$  to  $X^{65}$

5 individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group  
 10 having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group; and  $q^{55}$  to  $q^{65}$  individually represent an integer of 0 or 1,

[Formula 8]



( 8 )

wherein  $R^{24}$  to  $R^{29}$  represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;;  $X^{66}$  to  $X^{80}$  individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxyl group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group; and  $q^{66}$  to  $q^{80}$  individually represent an integer of 0 or 1.

13. The intermediate of a calixarene compound according to claim 12, wherein  $X^{13}$  to  $X^{80}$  in the formulas (2) to (8) are methyl groups.

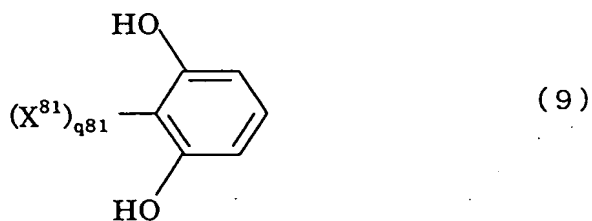
14. The intermediate of a calixarene compound according to claim 12, wherein  $q^{13}$  to  $q^{80}$  in the formulas (2) to (8) are 0.

15. The intermediate of a calixarene compound according to any one of claims 12 to 14, wherein  $R^7$  to  $R^{29}$  in the formulas (2) to (8) are individually an alkylene group having 3, 5, 7, or 8 carbon atoms.

16. A method for manufacturing a calixarene compound comprising condensing at least one compound shown by the

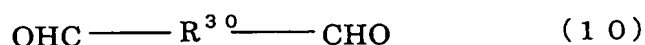
formula (9) and at least one compound shown by the formula (10):

[Formula 9]



wherein  $X^{81}$  represents a substituted or unsubstituted alkyl  
 5 group having 1 to 10 carbon atoms, a substituted or  
 unsubstituted alkenyl group having 2 to 10 carbon atoms, a  
 substituted or unsubstituted alkynyl group having 2 to 10  
 carbon atoms, a substituted or unsubstituted aralkyl group  
 having 7 to 10 carbon atoms, a substituted or unsubstituted  
 10 alkoxy group having 1 to 10 carbon atoms, or a substituted or  
 unsubstituted phenoxy group; and  $q^{81}$  is an integer of 0 or 1,

[Formula 10]



15 wherein  $R^{30}$  represents a substituted or unsubstituted alkylene  
 group having 1 to 8 carbon atoms.

17. The method according to claim 16, wherein  $X^{81}$  in the  
 formula (9) is a methyl group.

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18. The method according to claim 16, wherein  $q^{81}$  in the  
 formula (9) is 0.

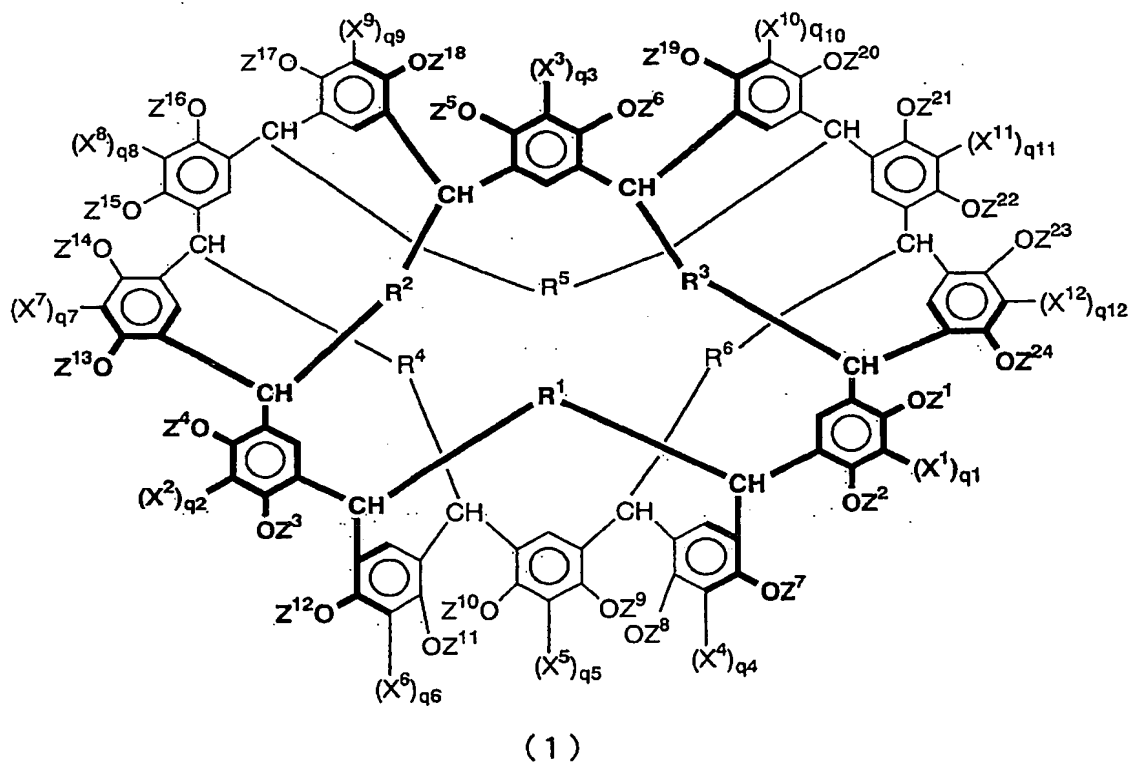
19. The method according to any one of claims 16 to 18, wherein  $R^{30}$  in the formula (10) is an alkylene group having 3, 5, 7, or 8 carbon atoms.

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20. A composition comprising a calixarene compound of the formula (1) and a solvent which can dissolve the calixarene compound:

[Formula 11]

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wherein  $R^1$  to  $R^6$  individually represent a substituted or unsubstituted alkylene group having 1-8 carbon atoms;  $X^1$  to  $X^{12}$

individually represent a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms, a substituted or unsubstituted alkenyl group having 2 to 10 carbon atoms, a substituted or unsubstituted alkynyl group having 2 to 10 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 10 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 10 carbon atoms, or a substituted or unsubstituted phenoxy group;  $Z^1$  to  $Z^{24}$  individually represent a hydrogen atom, a group having a polymerizable functional group, a group having an alkali-soluble group, or a substituted alkyl group having an alkyl chain with a 1 to 8 carbon atom content, or two adjacent Zs in combination represent a substituted or unsubstituted alkylene group having 1 to 8 carbon atoms;  $q^1$  to  $q^{12}$  individually represent an integer of 0 or 1.

21. The composition according to claim 20, wherein the calixarene compound has a polymerizable functional group for at least one of the  $Z^1$  to  $Z^{24}$  groups in the formula (1) and the composition further comprises a polymerization initiator.

22. The composition according to claim 20, wherein the calixarene compound has an alkali-soluble group for at least one of the  $Z^1$  to  $Z^{24}$  groups in the formula (1).